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SUPREME COURT, U.S.

IN THE

Supreme Court of the United States

October Term, 1977

STATE OF COLORADO, *Plaintiff*

v.

STATE OF NEW MEXICO
AND PAUL G. BARDAKE,
ATTORNEY GENERAL OF THE
STATE OF NEW MEXICO, *Defendants*

ADDITIONAL FACTUAL FINDINGS

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May 31, 1983

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ADDITIONAL FACTUAL FINDINGS

Pursuant to decision of the United States Supreme Court dated December 13, 1982 which suggested additional factual findings, the Special Master in compliance therewith submits the following additional findings in the areas and in the respective order as set forth in the decision of the Court.

I

**THE EXISTING USES OF WATER FROM THE
VERMEJO RIVER, AND THE EXTENT TO
WHICH PRESENT LEVELS OF USE REFLECT
CURRENT OR HISTORICAL WATER
SHORTAGES OR THE FAILURE OF EXISTING
USERS TO DEVELOP THEIR USES
DILIGENTLY**

There are nine existing users of the Vermejo River which were mentioned during the course of this case. The users range from corporations to individuals, and each of them use the water primarily for irrigation, except Kaiser Steel Corporation. The users are all in New Mexico, there being no appropriators of the Vermejo River in Colorado.

A more careful look at each user will reveal not only the type and amount of use, but the reasons behind current levels of use. It should be noted here, that while each party presented the evidence which it thought should be considered in making this presentation of use, the Master has carefully considered the evidence and testimony of both parties in this fact finding process.

In order to understand fully the significance of various figures used to represent acres and acre feet involved in the uses, the Master here notes that the maximum duty of water for irrigation on the lands involved is 2.0 acre feet of water per annum per acre of land irrigated. To illustrate, 100 acres irrigated would involve 200 acre feet of water. The Vermejo Conservancy District is excepted, its maximum duty of water for irrigation being 1.5 acre feet of water per annum per acre. One other point of clarification is presented here. Throughout the trial and, therefore, throughout these findings, reference is made to the Dawson gauge. The Dawson gauge is a stream gauging station operated by the U.S. Geological Survey on the Vermejo River

located one and a half miles above Dawson, New Mexico. The station is further downstream than the users here discussed except Phelps-Dodge, the Vermejo Conservancy District, and District users.

(A) One user is the Vermejo Park Corporation which primarily is an operation involving a hunting and fishing resort. The Corporation is a wholly-owned subsidiary of Pennzoil Corporation. Irrigated land is used to grow hay. The corporation has decreed rights to irrigate approximately 870 acres. The number of acres actually being irrigated is between 200 and 250. (Tr. 2059-2080)

New Mexico claims that all 870 acres would be irrigated if there was sufficient water, and that even current uses are threatened by priority calls from senior appropriations. However, there are several evidentiary highlights which lead the Master to believe that the Vermejo Park Corporation has not diligently put to use all the water available to it.

Testimony of New Mexico's State Engineer revealed that as second priority on the Vermejo, there generally would be enough water for the Park Corporation to irrigate more than 250 acres. (Tr. 2427). Table 2 of Colorado's Exhibit 5 which is the "monthly and annual discharge of the Vermejo River near Dawson, New Mexico" seems to further support the availability of water to Vermejo Park Corporation. The table indicates discharge at a point past several of the users. Various years from 1916 to 1979 are represented and the annual discharge in acre feet varies from 1,480 acre feet in 1951 to 64,420 acre feet in 1942 with an average discharge of 12,919 acre feet.

There was further testimony indicating other sources of irrigated lands available to the Park Corporation, sources dependent on "a completely different water system." (Tr. 2109, 11. 8, 9). It is the opinion of this Master that the availability of

other sources is but another factor in the Park Corporation's failure to fully develop use for Vermejo River water.

The Master also finds it significant that the water used by the Park Corporation comes from only one ditch, Ditch 13. There is no gauge on Ditch 13, and the amount of water taken is roughly measured by the number of waterings. (Tr. 2102-2103). There is little doubt that the people working with irrigation and waterings do know roughly how much water is used and the Master respects such skill; however, the fact remains that the use of water by the Vermejo Park Corporation is at best careless and thus not efficiently developed.

Finally, the threat of priority calls appears to the Master to be little more than informal requests. (Tr. 2086, 2088).

The failure of Vermejo Park Corporation to use its full decree of water appears not to be based on water shortages but on the lack of development and perhaps even the lack of need by the Park Corporation of the Vermejo water.

(B) A second user is Kaiser Steel Corporation which diverts Vermejo water for use in its coal mines. Kaiser Steel owns rights for 230 acre feet of water (acres being an inappropriate measure since the water is not used for irrigation) and leases another 400 acre feet from Phelps-Dodge. (Tr. 1721-1722). With 630 acre feet of water available, the maximum ever used by Kaiser Steel was 361.47 acre feet in 1976. (Tr. 1727, 1738).

Both Colorado and New Mexico are in agreement that one reason for the failure to fully develop the available water is the Kaiser mine at York Canyon. An average of 25% of Kaiser's necessary water is supplied from the York Canyon site. That diversion point is not directly on the Vermejo River and should be unaffected by prior Vermejo River diversions. (Tr. 1742-1744).

Once again, the flows at the Dawson gauge, as well as at the stateline (a measuring gauge installed by C. F. & I. which admittedly has some problems with accuracy) show no shortage

of water, either historically or at the present. It is the opinion of the Master that the water needs of Kaiser Steel are currently being met by development of only a portion of the Vermejo River water, supplemented from other sources. For this reason, Kaiser Steel has lost its incentive to fully develop all of the available Vermejo River water.

(C) A third user of Vermejo water is Phelps-Dodge, currently leasing their property to C. S. Cattle Company. Phelps-Dodge has first priority on the river and is entitled to irrigate 501.19 acres or 1,002.38 acre feet. As previously mentioned, Phelps-Dodge leases 400 acre feet to avoid forfeiture, leaving 602.38 acre feet or irrigation for 351.19 acres. (Tr. 2140, 2415-46, 2148).

Testimony of a C. S. Cattle Company employee indicated that prior to 1965, 450-500 acres of the Phelps-Dodge property were irrigated. However, a flood and a railroad altered irrigation processes and since 1965 only 80-150 acres have been irrigated. (Tr. 2174-2177). Granted, some of the land, not worth reclaiming from flood damage, accounts for the loss of irrigated acres. However, testimony revealed that up to 110 additional acres could have been irrigated without additional reclamation. (Tr. 2180). New Mexico claims the additional acres are not irrigated because there is insufficient water available and presented testimony (from a Phelps-Dodge employee) that all the land possible was currently being irrigated. A logical analysis of the water availability leads the Master to doubt the accuracy of New Mexico's claims.

Phelps-Dodge is one of the first users located below the Dawson gauge. (Colo. Ex. No. 5, fig. 1). The gauge then should prove to be a fairly accurate account of water available to Phelps-Dodge. The figures in Colorado Exhibit 5, Table 2, *supra* show an ample supply of water available annually for Phelps-Dodge. Furthermore, as user with first priority on the river (Col. Ex. No. 25, *Phelps Dodge Corp., et al. v. The W. S. Land and Cat-*

tle Co., et al., No. 7201, Dist. Ct., 8th Judicial Dist. New Mexico, Nov. 13, 1941), it is inconceivable to the Master that an insufficient amount of water is available for all of Phelps-Dodge's needs. Many other users with junior priorities are using fair amounts of Vermejo River water. If Phelps-Dodge was in need of and intended to fully develop all of its water rights, it seems very likely that it should and would be able to do so.

New Mexico also would "reserve" 220-900 acre feet of water which Phelps-Dodge is *not* using presently, but may want to use if it resumes mining on its property. (Tr. 2155-2158). The Master finds this rationalization for more water weakened by New Mexico's own view of the benefits claimed by Colorado, should they be given rights to Vermejo water. New Mexico claims the benefits stated by Colorado are speculative, problematic and insufficiently precise, (Defendants' Brief on Remand, pp. 62, 63) yet they would estimate Phelps-Dodge must be allowed access to 250 to 900 acre feet of water should they decide to reopen a coal mine. Furthermore, New Mexico does not indicate that there would be a problem should the extra water be needed. Presumably it is presently available, unused.

(D) The next users are considered as a group since they each divert their water at the Vermejo canal, from the Vermejo Conservancy District (District). These users include Pompeo, an individual user with rights senior to the District; Odom, an individual user with rights senior to the District; Porter, an individual user employed by C. S. Ranch (leasing the Phelps-Dodge property); Duell whose rights are now owned by Messick and Kaiser, Messick being an individual user with rights superior to the District; and an additional 46.73 acres belonging to the Vermejo Park Corporation previously discussed.

Pompeo, aside from being a farmer, is superintendent of the schools in Cimarron, New Mexico. He has rights to irrigate 101.5 acres and actually irrigates approximately 50 acres.

His testimony was that water from the river at flood stage is not usable. Pompeo has approximately 41.9 acres on a hill which he has irrigated in the past resulting in an unsuccessful crop. Now, he says, there is no water to irrigate his remaining acreage. (Tr. 2193-2204). There seems to be no question that water is available "in some form." (Tr. 2203, 11, 16, 17). Furthermore, Pompeo's rights are senior to the District; the District is receiving large amounts of water, and the readings at the Dawson gauge indicate sufficient water is available should Pompeo decide to diligently and efficiently develop it.

Odom, another individual using Vermejo water, has rights to irrigate 264 acres. Odom testified that when he first began farming the area in 1955, 264 acres were irrigated. Today he is irrigating 113 acres allegedly due to a lack of water; the decline occurring primarily in the early seventies. (Tr. 2208-2214).

Odom also has rights which are senior to the District and, once again, it would appear to the Master that the flow at the Dawson gauge indicates sufficient water to supply Odom with the water he lacks.

Porter is a third individual user and is employed by C.S. Cattle Company, the lessee of Phelps-Dodge's land and water rights. Porter has rights to 16.49 acres and actually irrigates about 14 acres. His rights are not senior to the District, yet he irrigates 85% of the land he is entitled to irrigate, with no allegation that lack of water is the reason behind failure to fully put to use the remaining water to which he is entitled. (Tr. 2186-2191).

Duell had water rights to irrigate 163.4 acres. The irrigation of 75 acres now belongs to Kaiser and the remaining water belongs to another individual, Messick. These rights are superior to the District and are fully developed and put to use. (Tr. 1028-1031).

Finally, the Vermejo Park Corporation has rights to ir-

rigate an additional 46.73 acres, the water being diverted from the District. The rights are fully developed and put to use. (Tr. 2109-2111).

(E) The Vermejo Conservancy District is the final user of Vermejo River water discussed in this case. The District irrigates an average of 4,379 acres, though it has rights from the Bureau of Reclamation for 7,979 acres. The District is part of a reclamation project which although expensive in terms of time and money, never lived up to its expectations or even proved to be a successful project, having failed to fully develop its entitled acreage. (Tr. 164-169).

There has been testimony from New Mexico witnesses to the effect that the diversion of water in Colorado would result in a water shortage felt almost entirely by the District with only *some* effect on other users. (Tr. 1323-24). This testimony leads to the conclusion that shortages resulting from Colorado diversion (if they exist at all) would be experienced in a project that has failed from the beginning to develop its allotted acreage, has failed to meet its financial obligations, and quite possibly should never have been built.

New Mexico claims that the nonuse on the part of the District is caused by the "drought" of the early seventies. However, the drought of the 1970's cannot be responsible for the nonuse which has existed in the District since its formation in the fifties, nonuse through a time period when all other users, and evidence from flow tables found sufficient water available. (Tr. 166-169, 2174-75, 2211-2213). Other testimony supported the contention that the shortage in the District resulted from unregulated stockponds, fishponds, and water detention structures. (Col. Ex. No.s 38, 40).

Finally, there is substantial evidence that the District receives one-third to one-half of its water from sources other than the Vermejo River. (Tr. 229). One major alternative source is

the Chico Rico providing approximately 35% of the District's water. Other sources include the Willow, Crow, Curtis and Salt Peter creeks. They may provide up to 10% of the water used by the District. Obviously, development of the entire allotment of water from the Vermejo is not a top priority in the District. Complete and diligent development does not appear to be essential, in part because of alternative sources and in part because of the inefficient and problematic operation of the District itself.

It is the opinion of the Master supported by substantial evidence that the existing users of Vermejo water have not diligently and efficiently developed uses which would justify their need to retain their full decreed irrigation or water rights. While shortages and dry years do exist in the history of the Vermejo River, it does not appear that those shortages are the basis behind the current users failure to fully develop their decreed water rights.

II

THE AVAILABLE SUPPLY OF WATER FROM THE VERMEJO RIVER ACCOUNTING FOR FACTORS SUCH AS VARIATIONS IN STREAMFLOW, THE NEEDS OF CURRENT USERS FOR A CONTINUOUS SUPPLY, THE POSSIBILITIES OF EQUALIZING AND ENHANCING THE WATER SUPPLY THROUGH WATER STORAGE AND CONSERVATION, AND THE AVAILABILITY OF SUBSTITUTE SOURCES OF WATER TO RELIEVE THE DEMAND FOR WATER FROM THE VERMEJO RIVER

The most difficult aspect of this area is making a determination on how to measure the available supply of water from the Vermejo River. Of course, variations in streamflow make it im-

possible to base the determination on one year, one month, or even one average.

Colorado determines the available supply of water by using basin discharge or water produced from the watershed upstream from a given point of diversion. (Tr. 416). Colorado further attempts to supply a figure for virgin flow of the river, 1955-1979. This figure is achieved by taking the average annual flow of the river at the Dawson gauge and adding the depletions of the appropriators prior to the gauge, an accretion between the gauge and the Vermejo Conservancy District, and a questionable 2,000 acre feet depleted by an unknown number, possibly hundreds of ponds and foot dams. The resulting figure reveals an average over 14,000 acre feet of water in the Vermejo River virgin flow. (Plaintiff's Brief on Remand, pp. 28-29).

Naturally, New Mexico does not agree with this method of determination. Instead, supposedly based on the prior decision of *Wyoming v. Colorado*, 259 U.S. 419 (1922), New Mexico terms available water as "divertable dependable water." (Tr. 1197-98). New Mexico further contends that average annual flows cannot be used in any way in determining divertable dependable amounts of water. However, New Mexico presents no alternative means of measuring the amount of available water. Unfortunately, because of the lack of control in actual water use (discussed below), it is difficult to determine exactly how much water has been and is being diverted by New Mexico users. Consequently a determination of available supply in the Vermejo River is equally difficult.

It is true that the guidelines set forth in *Wyoming v. Colorado, supra* are appropriate and should be applied in this case. The Master here sets forth provisions from the case that provide most helpful. The Court there declined to rely too heavily on the average flows and instead considered "the unalterable need for a supply which is fairly constant and dependable, or is suscepti-

ble of being made so by storage and conservation within practicable limits." For clarification, the Court noted "By this it is not meant that known conditions must be such as give assurance that there will be no deficiency even during long periods, but rather that a supply which is likely to be intermittent, or to be materially deficient at relatively short intervals, does not meet the test of practical availability." *Wyoming v. Colorado, supra* at 480. And finally, to meet the need, the Court finds that the doctrine of appropriation "lays on each of these states a duty to exercise her right reasonably and in a manner calculated to conserve the common supply." *Id.* at 484.

On the basis of these guidelines, it is difficult to depend entirely on Colorado's alleged virgin flow figures. New Mexico attempts to show the fault in averaging by removing the two highest flow years (1941, 1942) from 1921 to 1978 which changes the average from 12,800 acre feet to 10,900 acre feet. However, even an average of 10,900 acre feet at Dawson gauge would seem to provide a fair amount of available water, and more than enough to supply the current uses below the gauge.

Removal from consideration of the two lowest years as well as the two highest years from 1916 to 1979 (using figures from Colo. Ex. No. 5, Table 2) results in an average of 11,543 acre feet annually. And finally, the average annual acre feet in the 1970's with its alleged drought is 8,262. Obviously, the figures can be used to reach nearly any result, and averages are unfortunately unavailable to irrigate crops and provide water for other uses; however, it is the opinion of the Master that even looking at each individual month and each individual year, there does not exist a situation where supply is "intermittent" and "materially deficient at short intervals." A copy of the above-mentioned Table 2 is attached for the Court's own consideration.

In addition to consideration of figures, annual, average, or otherwise, the court in *Wyoming v. Colorado, supra* found the

existence of a duty to "conserve the common supply." The court in this case is also concerned with "the possibilities of equalizing and enhancing the water supply through water storage and conservation." (*Colorado v. New Mexico*, No. 80, pp. 12-13, December 13, 1982).

New Mexico argues in its Brief on Remand (citing supporting testimony) that there are no important aquifers in New Mexico (Tr. 1735), that development of a ground water source in the Vermejo Park Corporation through wells was unsuccessful because the wells were drilled in the wrong places (Tr. 2088-89), and that importing water to the City of Raton, New Mexico was probably necessary in spite of the construction of a reservoir nearby. (Tr. 1352-1353). The Master finds such testimony unhelpful in trying to determine how the users of Vermejo River water have attempted to enhance their water supply through storage and conservation.

On the other hand, Colorado argues that the Vermejo Conservancy District, the most affected by a Colorado diversion, has great ability to store water and enhance the supply. The District reservoirs primarily divert flows from the Chico Rico but can receive water from the Vermejo River. Two reservoirs can divert water only from the Vermejo, reaching a capacity of 15,200 acre feet. This testimony is from New Mexico's witness, the chief engineer of the Interstate Stream Commission. (Tr. 1296-1299).

The issue of conservation is one that will be dealt with in much greater detail later. However, the Master would here point out one area of contrast in conservation measures between New Mexico and Colorado, that of administration in water usage. Testimony is most revealing.

"The New Mexico State Engineer does not keep records, make measurements, or keep records of actual water use in the Vermejo basin. Neither does the water user, with one exception, with exception of the Kaiser

Steel, he does not make water users themselves make such measurements."

(Tr. 136, ll. 16-21). On cross examination by counsel for Colorado the New Mexico State Engineer explained:

Q. Wouldn't it be pertinent in your administration of the Vermejo River to know what the depletions and evaporation and so forth are between the Vermejo District headgate and the land in the District?

A. We have some idea of that. I understand you to say Mr. Mutz has developed certain figures. But, as I say, not necessary to our administration.

Q. Well, you administer the Vermejo Decree, do you not?

A. Only in the sense of occasional fieldtrips to determine primarily whether any unauthorized acreage is being irrigated. Whether any unauthorized—usage authorized by that decree or subsequent permits. But we do not administer the priorities and diversion rates adjudicated by the decree.

Q. Who does? Who does do that?

A. We talked about that some. There is a working among themselves, a cooperation over there. The people work the problems out among themselves. Occasionally complaining to us.

When we become involved then in the discussions and attempts to resolve the problem. So long as they are able to resolve them and live with it, then day-to-day administration of priorities and the rates of diversion is not necessary and not in the public interest.

It's costly and it costs those water users when we have to undertake that kind of administration. And I think that gives them some incentive to be reasonably cooperative in working out their problems locally.

(Tr. 2434, ll. 5-25; Tr. 2435, ll. 1-12).

The New Mexico State Engineer further testified that notices of forfeiture have not been issued in spite of long periods of nonuse. There are allegedly two reasons for the absence of forfeiture: (1) no complaints with which to initiate an investigation and (2) "the State Engineer simply does not have the staff to go out and monitor for nonuse." (Tr. 2426, ll. 9-11, *see also* Tr. 2425).

Compare the testimony of the State Engineer for the State of Colorado on direct examination:

[T]he Water Commissioner is really the first state official who in fact regulates the flows through the various canals and ditches and reservoirs that are decreed in the state.

The Commissioner is required to keep daily records insofar as he's capable of all of the diversions of the several ditches in his district.

He, of course, particularly in the mountainous areas of the west slope, is not able to visit each of those ditches on a daily basis. But generally in divisions 1 and 2, we are sufficiently staffed and water is of such a critical nature, and generally in short supply, that the Commissioner has daily records at least during the irrigation season when all of these decrees are exercised to a maximum.

The Commissioner's authority generally ends in terms of distribution of water at the headgate. The Commissioner may notify the owner of a ditch whether or not he's in priority for that day, and if he is in priority, he will tell him how much water he can divert.

Certainly not exceeding his decreed amount, but oftentimes less if he happens to be the last right that is in priority, and that water is then diverted from the headgate into the conveyance, whether an off-canal conveyance or canal.

The Commissioner then is charged by statute to determine that that water user is placing that water to beneficial use.

The measure of a water right in Colorado, each time one of the water courts is required to decree a change of use, or change in point of diversion, the first criteria applied is what has been the historic beneficial use.

Q. That is without regard to how much has been decreed, it's how much is actually applied to the land?

A. Absolutely, there can be decreed amounts which are far in excess of what the historic diversion has been, and the value of that water right is really what the historic right has been.

The Commissioner then is charged to insure that the owner of that right utilizes that water for beneficial use, and that he does not waste any of that water.

And our statutes allow that if a commissioner or the division engineer observes that a user is wasting water, he can determine what the amount of that waste is, and he can then reduce the amount diverted at the headgate by that amount of waste.

So the Commissioner is checking first for amount of water being taken from the stream, and under what priorities, and secondly, what uses and what practices are being used in the beneficial consumption of that water.

Q. It would be my understanding from what you said, you are the chief administrative official in the State of Colorado as to water rights?

A. Yes. The statutes are clear the State Engineer is the only official that has authority to administer the rights in the state.

Q. The division engineers and water commissioners you referred to work under your supervision?

A. That's correct.

Q. Would you please tell us your involvement in the administration of water as it relates to these compacts and court decrees? You touched upon it, but I wish you to go into greater detail.

A. Well, Colorado is party, as I stated, in eight Interstate Compacts, and two U.S. Supreme Court Decrees.

I dare say nearly all the streams in the state are subject to provisions of at least one Interstate Compact, and many as high as three.

The responsibility of my office is to insure that those interstate obligations are met within the terms of each of the various compacts.

The way in which that obligation is performed varies from basin to basin depending on which compact we are administering.

But generally it consists of the curtailment of water rights on a junior basis to insure that we meet Colorado's obligation.

For example, in the Rio Grande compact which is probably the most heavily administered stream in the state in terms of compact obligation, we often find it necessary to curtail water users on the Conejos River with priorities as early as 1851 in order to meet Colorado's obligation under the 1938 compact at the state line gauge between Colorado and New Mexico.

(Tr. 516, 11. 2-25; 519, 11. 1-21).

This testimony leaves little doubt that regardless of the variations in streamflow on the Vermejo River, the New Mexico users are not doing all that is possible to preserve and enhance their available supply.

It would appear that the only user with a need for a continuous supply of water is Kaiser; the other users engaged in irrigation, requiring water approximately four to five months out of the year. Kaiser's maximum use has been 361 acre feet in a year, this occurring only one year. (Tr. 1738). Considering that figure, Kaiser uses approximately 30 acre feet per month and the average is presumably somewhat lower. The monthly discharge at the Dawson gauge presented by Table 2 indicates that very

rarely is there less than 30 acre feet of water available. Furthermore, as discussed earlier, Kaiser also has a source of water in York Canyon, providing up to 25% of its water needs. (Tr. 1742-1744).

As for the other users, for the most part the months of April through September account for the highest flows at the Dawson gauge and presumably the wettest months occur when water is in highest demand. The fact that the Vermejo Conservancy District has a reservoir system has already been mentioned. Comparisons of irrigated acreage (N.M. Ex. F-37) to discharge at the Dawson gauge (Colo. Ex. 5, Table 2) indicate that the reservoir system, at least at times, has provided water in dry periods.

In spite of New Mexico's contention that there is "no alternative source of supply for any of the existing uses of Vermejo water," (Defendants' Brief on Remand, p. 34) the Master finds that some other water sources exist. While there was testimony that the Chico Rico has had some shortages in the last 30 years (Tr. 1332), there was also testimony that Kaiser has purchased 2,000 acre feet of water from the Cimarron River, expecting 800 acre feet (Tr. 1728), and that, as mentioned earlier when the users were discussed in detail, several other sources are available. There was evidence that the Vermejo Park Corporation, Kaiser and the Vermejo Conservancy District all have other water sources. The Master does not mean to imply that these alternate sources should and will be total replacements for the water from the Vermejo River. They are not sufficient for that purpose. They merely serve to "relieve the demand" for Vermejo River water, which water is not denied in its entirety to New Mexico users, nor will it be with the proposed Colorado diversion.

III

**THE EXTENT TO WHICH REASONABLE
CONSERVATION MEASURES IN BOTH
STATES MIGHT ELIMINATE WASTE AND
INEFFICIENCY IN THE USE OF WATER FROM
THE VERMEJO RIVER**

Conservation In New Mexico

To some extent conservation measures have been raised in the previous area of fact finding. Aside from major projects which would improve the conservation of Vermejo River water, the most important element is administration. The contrast earlier between the regulation and control in the two states should again be reviewed by the court. New Mexico argues that its users have no need for "government surveillance." (Defendants' Brief on Remand, p. 47). The Master is not suggesting "surveillance" in a manner oppressive or intrusive, but instead monitoring, regulating and controlling the system in an effort to determine more accurately actual use, and to decrease nonuse, waste and general inefficiency.

More careful administration in New Mexico might also alleviate some of the other problems causing water shortages or loss. One such problem is unregulated stockponds, fishponds and water detention structures. (Colo. Ex. No.s 38, 40). While there is no question that such water use is to a certain extent necessary and beneficial, some sort of restrictions should apply. The numbers of ponds and other structures might be limited; when appropriate, reuse should be developed; and, the extent of water diverted to these areas should be in some way monitored or controlled. There is some indication by New Mexico that approximately 2,024 stockponds exist in Colfax County. (Defendants' Brief on Remand, p. 53). Reduction and/or regulation of some type could not help but be an effort, however small, to conserve the water supply and put it to beneficial use.

There is at least some evidence in reports from the Bureau of Reclamation that available runoff is not being diverted because dams and supply canals are blocked with silt and other debris. (Colo. Exs. No.s 38, 40, 43; Tr. 2200). Proper administration would make users aware of the diversion problem and perhaps the state and its users together could find means to clean up the canals and prevent further clogging.

Another problem contributing to water waste and inefficiency is the inability to control headgate spills, divert all the water available, and fully develop all available stream sources. (Tr. 1830-1834, 1913-1914). Perhaps repair or revision of the necessary structures is all that is needed, or perhaps resort to a project of more complicated construction is necessary. The Master does not mean to suggest that burdensome and unreasonable efforts are required to be undertaken by New Mexico; however, reasonable repair based on careful development and administration could further reduce water shortages caused by inefficiency and waste.

One final problem area which the Master believes could be improved with proper administration is the failure of many users to devote sufficient time to the complete development of available water resources. Water shortages are a reality in arid western states and, therefore, water conservation is a task that must involve serious effort and attention together with large amounts of time and financial input. The Master understands the intense feelings that some of the individual users have for their land and their lifestyle (See Tr. 2192, 2206, 2215-16); the Master also understands that farming or ranching often needs to be supplemented by other sources of income and, therefore, other jobs. (See Tr. 2207). However, New Mexico users, individuals, or otherwise, cannot expect to be able to take the available water in the Vermejo River at their convenience without taking the time and energy to implement changes and development to help conserve and augment the available water. Careful monitoring and regulation as part

of a program of administration would aid all users in full development of their water supply and demands.

At the heart of New Mexico's water problem is the Vermejo Conservancy District. Whether lack of administration, lack of diligence, lack of resources or lack of ability is the cause, there is little doubt that the District has failed as a water reclamation project and has serious financial and operational problems of its own. (Tr. 164-169). Several of the conservation problems already discussed are present in the District. Furthermore, there is a problem of loss through evaporation in the District's seven reservoirs. (Tr. 863, 1296-1299). The District has a 32% efficiency to farm headgates and an overall system efficiency of 24.6%. (Tr. 2576). New Mexico claims that the District falls middle range in reclamation project efficiencies. (Tr. 1410-1411). However, the existence of other low efficiency systems is not justification for failure to fully develop water sources here. New Mexico argues that Colorado has merely pointed out areas of inefficient water use without making viable suggestions which would reduce or eliminate the inefficiency. It is the opinion of the Master that New Mexico's inefficient water use should not be charged to Colorado.

As for major projects concerning water conservation, New Mexico is to be commended. A closed stockwater system has been completed since the start of this trial. The effort to provide funding and construction has been considerable. Users of the system hope to conserve nearly 2,000 acre feet of water. (Defendants' Brief on Remand, pp. 43-45). There seems little point in further discussion of the benefits of a closed system. The system exists and its benefits are to be felt by New Mexico users. New Mexico claims, however, that the water conserved by the system is needed by New Mexico users. The Master is of the opinion that based on the evidence in its entirety, there is already sufficient water if New Mexico would take every opportunity to develop their

resources fully. With proper conservation measures, there is an adequate water supply to satisfy the needs of all users.

Conservation Measures in Colorado

New Mexico argues that the tentative nature of the plans of C F & I for design and diversion make it impossible to conclude that Colorado's conservation measures are sufficient. (Defendants' Brief on Remand, pp. 54-55). However, since Colorado is not presently using Vermejo River water, it is difficult to do more than consider Colorado's proposed uses and the proposed conservation measures which would accompany those uses. Administration being one consideration, the Court might refer back to the testimony of Colorado's state engineer relating to regulation and control of Colorado water users. It appears from that testimony that Colorado keeps a fairly close monitor on its users. This cannot help but be an aid to water conservation.

Testimony also reveals that Colorado intends to use and reuse much of the water diverted from the Vermejo River. Agriculture, timber operations, energy development, and industry are a few examples of the type of use. The contention is that for agricultural use the efficiency will be 60-75%. (Tr. 738-749).

There is no reason to doubt the validity of Colorado's proposals or intentions. Even if the actual does not comport with the ideal, it is not for the Master or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado. The strict administration of water already on display in Colorado increases the likelihood that the proposed measures will be implemented at least to a reasonable degree.

IV**THE PRECISE NATURE OF THE PROPOSED
INTERIM AND ULTIMATE USE IN
COLORADO OF WATER FROM THE
VERMEJO RIVER, AND THE BENEFITS THAT
WOULD RESULT FROM A DIVERSION TO
COLORADO**

During the course of the trial, Colorado gave a considerable amount of evidence concerning the proposed uses of Vermejo River water in the state. Worthy of brief mention is the proposed interim use, to be implemented until industrial and other uses can be fully developed. Colorado proposes to temporarily use the diverted Vermejo River water for irrigation of 2,000 acres of agricultural land owned by C F & I. Plans to use and reuse the water as it flows down the valley result in a high efficiency expectation. (Tr. 744-746).

During the interim period more permanent uses of the water will be put into operation. The permanent uses include: a water powered hydroelectric plant generating power for a sawmill and related timber operations; coal washing at C F & I coal mines which would save transportation of the waste material from the mines to Pueblo, Colorado as well as development of additional coal mines; domestic and recreational purposes; possible synthetic fuel development; and, supplementation of current inadequate water supply in Colorado, including both C F & I uses as well as city and conservancy district (irrigation) shortages. (Tr. 738-749, 795-96, 623-639, 654, 656).

In response to these proposals set forth by Colorado, New Mexico argues that they are speculative, unproven and indefinite in nature. Projected costs are tenuous to nonexistent. Furthermore, on an agricultural comparison, New Mexico claims that Colorado has no benefit which could serve to outweigh the benefit

of the water used in New Mexico and, therefore, its subsequent loss. (Defendants' Brief on Remand, pp. 55-63).

This area of fact finding is one of the most difficult because of the necessarily speculative nature of benefits to be experienced by one not currently using the water. A further problem which faces Colorado in this area of testimony is the natural reluctance to spend large amounts of time and money developing plans, operations and cost schemes if the proposals are going to be made impossible should water not be diverted.

The Master has viewed the evidence on this question with these problems and restrictions in mind, and concludes that the benefits to be experienced by Colorado upon the development of Vermejo River water are substantial. Beginning with interim use, the argument is raised that the use is not cost efficient or justified. Testimony on behalf of Colorado did not deny the contention, and it is precisely this inability to fully and efficiently develop the interim use that makes the use temporary and not permanent. However, whether the project is totally cost efficient or not, the efficiency of water use based on repeated application is very high, and the benefits gained by the agricultural land because of additional water, however temporary, are undeniable.

As for the permanent uses, there is no way for the Master or the Court to know, even with more definite plans and projections, how many of the uses would be developed to a final stage of operation. However, this difficulty cannot be allowed to prevent Colorado from receiving its rightful supply of water. In spite of the speculative nature of the proposals and benefits, the Master believes that there is enough evidence to justify diversion of Vermejo River water to Colorado resulting in considerable benefits. Looking back to the list of proposed uses, if even half of them are fully implemented, Colorado would benefit from the Vermejo water. One of the more important uses, which is certain to occur, is that the water appropriated from the Vermejo River will supplement the existing insufficient water supply

available to Colorado users. There seems to be little doubt that the Purgatoire River system is overappropriated, demand exceeding available supply. Any additional water would help to relieve shortages. C F & I and the city of Trinidad are but two examples of users that would benefit by having water available to meet their demands. (Tr. 535-538, 623-630, 795-96). There is some thought that the benefit of alleviating these shortages is sufficient to justify Colorado diversion of Vermejo water; however, Colorado's proposal does not stop with alleviating shortages but goes on with major plans for the water and thereby additional benefits. See proposed uses listed above.

Therefore, in light of the proposed as well as near certain benefits, considered together with the following issue of New Mexico injuries, it is the opinion of the Master that the evidence supports a finding that the Colorado uses are sufficiently weighty to allow an appropriation of Vermejo water.

V

**THE INJURY, IF ANY, THAT NEW MEXICO
WOULD LIKELY SUFFER AS A RESULT OF
ANY SUCH DIVERSION, TAKING INTO
ACCOUNT THE EXTENT TO WHICH
REASONABLE CONSERVATION MEASURES
COULD OFFSET THE DIVERSION**

The State of Colorado argues that the injury of New Mexico, if any exists at all, could be alleviated by implementation of reasonable conservation measures. It is noted that there is some contention on the part of Colorado that there is sufficient water for all users (including Colorado) now if the uses were fully and efficiently developed. (Plaintiff's Brief on Remand, p. 52).

However, New Mexico raises several points arguing that the injury would be substantial and no reasonable or feasible conservation measures are available to mitigate that injury. The Master presents several of New Mexico's points with brief comment.

New Mexico points out the benefits which result from the use of Vermejo River water, arguing that upon Colorado diversion, users will have to find other more costly sources of water or avoid water use altogether. However, this argument is unnecessary since neither the Master nor Colorado contends that New Mexico fails to benefit from Vermejo River water. Everyone agrees that the benefits exist. The Master merely points out that these benefits are not being taken away from New Mexico by the Colorado diversion. In the first place, it is not as if all the Vermejo River water was to be diverted by Colorado; as best can be determined from all available evidence, only about one-third of the total divertable water in the Vermejo River would be diverted by Colorado. And secondly, as the Master has pointed out throughout these findings, reasonable conservation measures on the part of New Mexico could increase its available supply of water to a point where the Colorado diversion might not have any impact at all. New Mexico cannot be allowed to neglect implementation of reasonable administration and conservation measures and at the same time complain that Colorado is denying it the benefit of water from the Vermejo system.

New Mexico discusses the growth and development of Colfax County as a result of the Vermejo benefits. The growth occurred in "the decade of the 1970's." (Defendants' Brief on Remand, p. 67). However, in earlier discussion of historic water uses and supply, the decade of the 70's was labelled a drought period. (Tr. 2211-2213, 1179, 1193). The Master does not find the need to speculate or determine the accuracy of these positions, but merely notes that they do not appear to conform.

New Mexico claims injury through Kaiser Steel which accounts for a portion of county employment. New Mexico states that the York Canyon mine is Kaiser's sole operation, and all activities at that mine are dependent on the Vermejo. However, the accuracy of that statement is doubtful in the Master's mind. The testimony indicated that the failure of Kaiser to develop the full allotment of their water was the development of the mine at York Canyon. (Tr. 1727, 1746-47; Defendants' Brief on Remand, p. 16). Furthermore, Kaiser has two diversion points, one in York Canyon at the mine site and one directly on the Vermejo River. The first point of diversion in York Canyon diverts water *not yet meeting* the Vermejo River. If water is not diverted at the York Canyon site, it flows to the second diversion point on the Vermejo or on past to other Vermejo users. (Tr. 1742-44). Approximately 25% of the water used by Kaiser comes from the first diversion point (Tr. 1744), water which has not yet reached the Vermejo River and, therefore, cannot be affected by diversion of water from the Vermejo River in Colorado. The injury then is not as all encompassing as has been represented and in fact may be little injury at all.

New Mexico contends that in dry years its injury will be even greater because in those years Colorado will take all of the water with its share. It should be noted that a large portion, close to three-fourths of the water used by New Mexico Vermejo River users, is produced in Colorado. However, some of that production occurs in Colorado *after* the Colorado point of diversion. (See. Colo. Ex. No. 5, fig. 1). Thus, Colorado's use, like that of New Mexico, is subject to variations in the natural water supply, wet years providing substantial water and dry years resulting in some shortages and greater need for careful use.

Further argument is made by New Mexico that the injury is divided among all users, negative effects reaching each type of water application in New Mexico, and that there is nothing to offset the alleged shortage from Colorado diversion. However,

testimony of New Mexico's witness indicated that the shortage caused by a Colorado diversion would be felt *primarily* by the Vermejo Conservancy District. (Tr. 1323). As noted earlier, the District has a reservoir system allowing carryover from wet years to supply water during periods of shortage. Therefore, the user most affected *does* have a means of offsetting the possible shortage. Furthermore, the Master notes once again that with reasonable and careful conservation measures the possible shortages may not exist at all.

The injury, New Mexico fears, may even extend to the federal government, to whom the Vermejo Conservancy District owes in excess of two million dollars. However, such a state of affairs would be nothing new in this case. From the beginning the District has had problems making their payments. (Tr. 168; Plaintiff's Ex. No. 38, Plaintiff's Ex. No. 6, p. 9). Remedies from reduced payments to bills in the legislature relieving the District of payments altogether have been proposed. In this light, it hardly seems reasonable or accurate to blame the District's debt default on the proposed Colorado diversion.

Finally, New Mexico presents an impressive array of figures allegedly representing the economic injury resulting from reduced water supply. However, for the most part these figures presuppose that no Vermejo River water is available for New Mexico users, and such is not the case even if New Mexico does not implement any additional conservation measures. Colorado would be diverting less than one-half of the water *it*, as a state, produces. New Mexico users of Vermejo water are not suddenly faced with a dry riverbed; water still flows through New Mexico in the Vermejo River and its tributaries. Furthermore, at the risk of becoming redundant, the Master once more points out that *reasonable* conservation measures, primarily in the form of administration, are available to New Mexico, and should they be implemented would reduce New Mexico's "loss" to insignificance.

For the above-stated reasons the Master concludes that "the injury, if any, that New Mexico would likely suffer as a result of [the] diversion, taking into account the extent to which reasonable conservation measures could offset the diversion," is insubstantial and does not outweigh the benefits which Colorado would gain as a result of the Vermejo diversion.

CONCLUSION

In conclusion the Special Master finds that the following points, detailed above are supported by clear and convincing evidence:

1. The existing uses of Vermejo River water are beneficial and numerous. While historical shortages are present, the current levels of use primarily reflect failure on the part of existing users to fully develop and put to work available water.
2. The available supply of water from the Vermejo River is sufficient for current New Mexico users, and with reasonable conservation measures would meet the needs of Colorado users as well. The available water supply can be enhanced through diligent and complete development of the Vermejo source as well as alternative sources. Many current users do not require a continuous supply and systems of reservoirs provide relief for those who do.
3. Reasonable conservation measures in both states would go far in eliminating nonuse or inefficiency, resulting in a greater supply of water. While New Mexico has implemented some major conservation measures, administration is an area in which improvement would touch on many aspects of conservation and water use development.

Reasonable conservation measures in Colorado would also serve to enhance water supply. The evidence presented by Colorado leaves little doubt that such measures will be implemented.

4. Colorado's proposed interim use is agricultural in nature, with more permanent uses developed in industry, energy production, recreation and domestic areas. Furthermore, water shortages and instances of overappropriation in Colorado would be relieved by a Vermejo diversion. Colorado would benefit greatly from the additional water even if only a portion of the proposed uses were implemented.

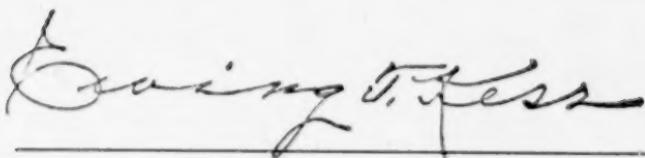
5. The injury, if any, to New Mexico resulting from the Colorado diversion could be offset by reasonable conservation measures.

As a final consideration, the Master examines the equities of this case. The evidence revealed that Colorado produces approximately three-fourths of the water in the Vermejo system. As mentioned previously, a portion of that water is produced in Colorado *after* the proposed point of diversion. Even with the proposed diversion, New Mexico would still be the recipient of one-half of the water produced in Colorado and approximately two-thirds of the water produced in the entire system.

Evidence supports the finding that New Mexico's injury as a result of this diversion is nonexistent or could be easily offset by reasonable conservation measures. In addition, the equities are with Colorado, which requests only a portion of the water which it produces.

On the basis of the foregoing the Special Master reaffirms his original recommendation made in the report of December 31, 1981.

Dated at Cheyenne, May 31, 1983.



EWING T. KERR
Special Master

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APPENDIX

TABLE 2

Monthly and Annual Discharge of the Vermejo River near Dawson, New Mexico (in acre-feet)

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1916	615	604	967	515	665	452	819	2,730	498	961	7,470	1,270	17,000
1917	796	466	393	357	311	212	388	5,760	2,330	1,820	659	551	14,040
1920	1,190	503	916	692	962	1,090	544	2,030	2,180	1,830	1,500	1,793	14,230
1928	484	356	92	200	306	308	688	2,490	2,460	1,660	2,610	208	11,860
1929	362	285	215	209	222	277	476	2,040	1,630	350	6,430	2,500	17,000
1930	984	714	553	361	478	543	1,740	1,700	1,040	2,470	3,640	1,060	15,280
1931	1,370	405	214	222	387	700	1,350	4,940	1,880	1,120	902	883	14,400
1932	395	125	105	230	458	244	754	3,560	1,950	1,320	1,630	764	11,500
1933	389	262	135	119	335	470	303	2,050	2,360	1,990	1,160	419	9,990
1934	151	196	186	274	411	514	698	952	553	520	833	141	5,430
1935	97	160	146	236	181	211	258	2,120	1,870	1,060	1,790	1,680	9,830
1936	451	334	174	220	230	231	645	1,250	969	935	1,910	835	8,180
1937	486	288	171	83	334	399	3,570	3,770	3,210	1,950	1,800	635	16,700
1938	364	168	154	132	95	134	2,070	4,780	2,640	1,900	2,370	2,500	17,310
1939	2,240	496	328	212	164	724	1,380	1,830	828	608	965	264	10,040
1940	232	189	138	151	312	311	282	1,250	705	1,100	6,480	776	11,930
1941	286	239	347	375	348	986	3,360	22,900	10,050	6,070	3,500	4,430	52,890
1942	3,170	1,820	670	811	645	914	22,030	17,250	5,380	3,560	3,500	4,670	64,420
1943	1,380	936	730	833	739	542	197	639	223	663	2,770	588	10,240
1944	422	292	340	369	455	447	1,420	6,800	3,210	2,430	948	390	17,520
1945	452	317	301	310	392	243	188	1,900	1,130	1,180	2,540	275	9,230
1946	279	167	90	141	179	357	293	146	38	703	3,570	1,380	7,340
1947	371	432	293	158	212	242	316	5,110	926	1,610	2,420	901	12,990
1948	507	301	292	360	582	887	1,930	7,640	4,670	1,750	1,120	144	20,180
1949	340	276	113	225	337	228	472	2,050	2,830	2,980	1,900	1,530	13,280
1950	345	315	158	278	195	108	120	82	315	2,800	478	207	5,400
1951	83	53	62	74	89	49	79	252	234	206	276	22	1,480
1952	9.1	2.4	36	94	69	68	263	2,090	1,620	303	1,040	611	6,210

TABLE 2 (Continued)

Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1953	70	60	87	168	135	156	142	1,010	855	1,690	1,200	136	5,710
1954	79	208	191	187	164	111	79	652	204	759	613	91	3,340
1955	33	25	38	60	110	94	72	8,240	2,990	2,530	9,010	1,730	24,930
1956	624	352	422	338	185	132	101	355	203	342	582	26	3,360
1957	9.5	8.7	109	133	95	70	244	2,050	3,830	3,800	4,760	1,030	16,140
1958	1,090	752	724	522	463	581	4,150	10,610	3,830	2,080	1,690	765	27,260
1959	301	440	462	331	378	304	328	500	1,130	418	1,410	154	6,160
1960	266	227	229	233	252	375	459	469	740	1,930	559	179	5,890
1961	1,440	370	293	215	240	454	2,370	3,580	2,410	2,450	4,590	1,510	19,910
1962	824	741	461	429	568	483	2,690	2,310	1,020	1,660	1,130	593	12,920
1963	371	291	195	118	297	276	253	124	121	114	899	2,540	5,600
1964	149	249	194	104	213	296	502	806	431	329	419	36	3,730
1965	56	77	127	197	176	248	347	3,920	10,540	2,200	3,950	1,060	23,010
1966	385	387	450	290	333	377	229	455	490	1,400	3,940	1,350	10,080
1967	305	330	250	404	361	227	88	59	222	1,850	2,550	1,780	8,440
1968	468	450	300	429	683	576	482	3,440	2,420	2,290	2,380	452	14,380
1969	293	317	344	402	324	354	428	1,040	914	2,870	2,340	1,520	11,150
1970	980	642	393	355	330	259	1,800	3,050	1,450	2,030	1,160	581	13,030
1971	510	474	263	237	270	257	97	268	106	1,260	1,120	803	5,660
1972	459	401	323	288	242	154	223	207	91	641	985	663	4,680
1973	140	215	159	150	195	299	1,950	3,630	3,150	1,640	865	534	12,920
1974	308	244	173	296	298	267	112	242	197	157	537	206	3,040
1975	174	137	40	40	134	228	424	1,400	1,410	2,690	662	194	7,530
1976	75	103	166	149	169	112	116	616	540	2,270	1,130	1,200	6,640
1977	129	126	86	91	165	222	458	337	496	2,110	3,490	182	7,900
1978	111	250	211	207	159	160	173	1,710	1,590	2,980	986	121	8,650
1979	107	271	185	191	214	230	426	3,240	3,830	1,860	1,650	372	12,570
Sum Average													710,830
													12,919

Data source: Official publications of the U.S. Geological Survey.